

Appendix 3-G (Risk Chapter)

Supplementary General Population

Exposure Information

This appendix presents information used to model and calculate the general population exposure values presented in Chapter 3.

Generic Facility Assumptions

The following assumed values were used in the exposure modeling:

Table 3-G Generic Facility Assumptions for General Population Exposure Assessment

Ink type	Facility building height (m)	Facility stack height (m)	Facility stack diameter (m)	Stack exit temperature (K)	Stack exit velocity (m/s)
Solvent-based ^a	6.1	9.1	0.61	436	17.78
Water-based ^a	6.1	9.1	0.71	344	17.78
UV-cured ^b	6.1	9.4	0.61	317	7.87

^a Reference 1

^b Reference 2

Fugitive emissions from long web runs, e.g., vapors that leak from the building windows and roof vents, were assumed to take place over an area of 100 square meters for the generic facility.

The weather conditions of the facility were assumed to be the same as those at San Bernardino, California. These conditions were assumed because they would result in the highest average air concentration (from the facility's air releases) of any of the approximately 500 weather stations in the United States.

Since flexographic printing facilities were expected to be located in urban areas, the urban mode of the model was selected. Finally, the following distances from the facility were selected for concentration calculations: 100 meters (m), 200 m, 300 m, 400 m, 500 m, and 1000 m.

Model Input Parameters

The Industrial Source Complex Long Term (ISCLT) Model (3) calculated more than one chemical at a time and was run in "Urban 3" mode. Also entered into the model was the decay rate of the chemical, entered as its half-life in seconds.

The Industrial Source Complex Long Term (ISCLT) Model used in this report required entries for the following inputs:

Fugitive releases: substance average annual release rate (g/s/m²)

Stack releases: substance average annual release rate (g/s)

stack height (m)

stack diameter (m)

stack exit temperature (°K)

stack exit velocity (m/s)

Both releases: zip code or latitude/longitude for weather station

distances from facility to calculate concentration (m)

rural or urban mode

building height (m)

substance half-life in air (s)

Sample Calculation of General Population Exposures

As discussed in Chapter 3, the toxicity concerns for the chemicals of interest dictated that either the Average Daily Dose (ADD) or the Average Daily Concentration (ADC) were the appropriate exposure values. The available toxicity factors indicated which of the two values should be used for subsequent risk calculations. The calculations were as follows:

$$\text{ADD (mg/kg-day)} = [(C)(IR)(ED)(1 \text{ mg}/1000\text{ug})]/[(BW)(AT)]$$

$$\text{ADC (mg/m}^3\text{)} = [(C)(ED)(\text{mg}/1000\text{ug})]/(\text{AT})$$

where:

C = chemical concentration in air from air dispersion modeling (ug/m^3)

IR = inhalation rate; $13.2 \text{ (m}^3/\text{d)}$ average of adult male and female recommended rates (4)

ED = exposure duration (days): for residential exposures, this is a multiple of (time per day) by (years per residence), minus assumed vacation time of 14 days/yr. One source (5) has 30 years as the 95th percentile value for the latter, and time per day values of 16.4 hours/day average indoors and recommended 2 hours outdoors.

BW = average body weight; 70 kg, standard average of male and female adult weights

AT = averaging time; 30 years (time per residence, from above).

$$\text{ADD for residence} = (C)(13.2\text{m}^3/\text{d})(30\text{yr} * [(365d/yr * 18.4\text{hrs}/24\text{hrs/d}) - 14\text{d vacation}]) * (\text{mg}/1000\text{ug}) / [70\text{kg} * (30\text{yrs} * 365\text{d/yr})]$$

$$\text{ADC for residence} = (C)(13.2\text{m}^3/\text{d})(30\text{yr} * [(365d/yr * 18.4\text{hrs}/24\text{hrs/d}) - 14\text{d vacation}]) * (\text{mg}/1000\text{ug}) / (30\text{yrs} * 365\text{d/yr})$$

Regional Exposure

For determining regional exposure, the model used was BOXMOD, also implemented in the Graphical Exposure Modeling System (6). BOXMOD used a parameter called "Time Constant" to account for chemical degradation. The time constant is the inverse of the rate of decay used for the ISCLT model. BOXMOD modeling was discontinued after partial modeling placed individual exposures uniformly at one-half to one-third of the local exposure estimates.

REFERENCES

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4. EPA. 1997. Exposure Factors Handbook Volume I: General Factors. Washington, DC: U.S. Environmental Protection Agency. EPA/600/P-95/002Fa. August, 1997.
5. EPA. 1997. Exposure Factors Handbook Volume III: Activity Factors. Washington, DC: U.S. Environmental Protection Agency. EPA/600/P-95/002Fc. August, 1997.
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Appendix 3-H (Risk Chapter)
General Population Exposure Data

Table 3-H.1 General Population Exposure Results, Fugitive and Stack Concentrations ^{a, b}

Chemical category (additives in italics)	Blue		Green		White		Cyan		Magenta	
	Concentration ($\mu\text{g}/\text{m}^3$)									
	fugitive	stack	fugitive	stack	fugitive	stack	fugitive	stack	fugitive	stack
Solvent-based Ink #S1 – Site 9B										
Alcohols	2.86e+00	3.54e-02	2.05e+00	2.53e-02	7.68e+00	9.49e-02	9.89e-01	1.22e-02	1.28e+00	1.59e-02
Alcohols	1.79e+01	2.24e-01	1.52e+01	1.90e-01	9.88e+01	1.23e+00			6.80e+00	8.48e-02
Alkyl acetates	9.53e+00	1.19e-01	1.09e+01	1.36e-01	7.68e+00	9.49e-02			5.83e+00	7.27e-02
Alcohols			3.07e+01	3.83e-01			3.59e+01	4.48e-01	3.29e+01	4.11e-01
Alkyl acetates			2.03e+00	2.53e-02			3.92e+00	4.89e-02	9.71e-01	1.21e-02
Propylene glycol ethers							2.45e+00	3.06e-02	1.94e+00	2.42e-02
Hydrocarbons - low molecular weight					8.74e+01	1.09e+00				
Alkyl acetates					2.02e+01	2.52e-01				
Additive: <i>Propanol</i>	9.89e+00	1.23e-01			4.95e+00	6.17e-02				
Additive: <i>n-Propyl acetate</i>							2.27e+00	2.84e-02		
Additive: <i>Propylene glycol ether</i>									1.66e+00	2.07e-02
Solvent-based Ink #S2 – Site 5										
Alcohols	5.31e+01	6.63e-01	5.09e+01	6.35e-01	1.03e+02	1.28e+00	7.10e+01	8.86e-01	4.80e+01	6.00e-01
Alkyl acetates	1.22e+01	1.52e-01	1.08e+01	1.35e-01	4.88e+00	6.09e-02	2.00e+01	2.50e-01	1.24e+01	1.55e-01
Hydrocarbons - low molecular weight	1.11e+01	1.38e-01	1.64e+01	2.05e-01	5.45e+01	6.80e-01	1.42e+01	1.78e-01	2.48e+01	3.10e-01
Alcohols	6.67e+00	8.24e-02	7.57e+00	9.37e-02	1.12e+01	1.39e-01	9.91e+00	1.23e-01	1.37e+01	1.69e-01
Hydrocarbons - low molecular weight	5.61e-01	6.93e-03	4.25e-01	5.28e-03	2.30e+00	2.87e-02	8.94e-01	1.12e-02		
Alcohols	6.78e+00	8.45e-02	7.86e+00	9.82e-02			9.01e+00	1.13e-01	8.08e+00	1.01e-01
Solvent-based Ink #S2 – Site 7										
Alcohols	2.25e+01	2.81e-01	2.21e+01	2.76e-01	4.27e+01	5.33e-01	1.91e+01	2.38e-01	2.33e+01	2.91e-01
Alkyl acetates	2.01e+01	2.51e-01	1.87e+01	2.34e-01	2.43e+01	3.03e-01	1.77e+01	2.21e-01	2.06e+01	2.57e-01
Hydrocarbons - low molecular weight	8.56e+00	1.07e-01	9.29e+00	1.16e-01	3.53e+01	4.41e-01	5.83e+00	7.27e-02	1.55e+01	1.93e-01
Alcohols	5.15e+00	6.37e-02	4.28e+00	5.29e-02	7.26e+00	8.98e-02	4.06e+00	5.01e-02	8.51e+00	1.05e-01
Hydrocarbons - low molecular weight	4.32e-01	5.40e-03	2.40e-01	3.00e-03	1.49e+00	1.86e-02	3.65e-01	4.56e-03	5.44e-01	6.79e-03
Alcohols	5.68e+01	7.09e-01	5.85e+01	7.30e-01			4.64e+01	5.79e-01	6.02e+01	7.51e-01
Additive: <i>Propanol</i>					9.61e+01	1.20e+00				

Table 3-H.1 General Population Exposure Results, Fugitive and Stack Concentrations ^{a,b} (continued)

Chemical category (additives in <i>italics</i>)	Blue		Green		White		Cyan		Magenta	
	Concentration ($\mu\text{g}/\text{m}^3$)									
	fugitive	stack	fugitive	stack	fugitive	stack	fugitive	stack	fugitive	stack
Solvent-based Ink #S2 – Site 10										
Alcohols	1.82e+01	2.27e-01	2.25e+01	2.81e-01	3.76e+01	4.70e-01	1.84e+01	2.30e-01	1.92e+01	2.40e-01
Alkyl acetates	1.16e+01	1.45e-01	1.16e+01	1.45e-01	1.31e+01	1.64e-01	1.43e+01	1.78e-01	5.77e+00	7.20e-02
Hydrocarbons - low molecular weight	6.92e+00	8.63e-02	9.49e+00	1.18e-01	3.12e+01	3.89e-01	5.62e+00	7.01e-02	1.28e+01	1.59e-01
Alcohols	4.17e+00	5.15e-02	4.37e+00	5.41e-02	6.41e+00	7.92e-02	3.91e+00	4.84e-02	7.03e+00	8.69e-02
Hydrocarbons - low molecular weight	4.36e+01	4.36e-03	2.45e-01	3.06e-03	1.31e+00	1.64e-02	3.52e-01	4.40e-03	4.49e-01	5.61e-03
Alcohols	5.64e+01	7.03e-01	6.15e+01	7.67e-01			3.23e+01	4.03e-01	7.40e+01	9.23e-01
Additive: <i>Propanol</i>					1.14e+02	1.42e+00				
Additive: <i>Propylene glycol methyl ether</i>							2.91e+01	3.64e-01	6.43e+00	8.03e-02
Additive: <i>2-Methoxy-1-propanol</i>							5.95e-01	7.43e-03	1.31e-01	1.64e-03
Water-based Ink #W1 – Site 4										
Amides or nitrogenous compounds	1.21e+00	4.18e-01	1.03e+00	3.56e-01	7.64e+00	2.65e+00	3.04e-01	1.05e-01	3.32e-01	1.15e-01
Alcohols	9.36e+00	3.25e+00	5.37e+00	1.86e+00	1.53e+01	5.29e+00	1.14e+00	3.96e-01		
Ethylene glycol ethers	2.95e+00	1.03e+00	1.76e+00	6.17e-01			2.07e+00	7.25e-01	2.14e+00	7.48e-01
Alcohols	4.82e-01	1.67e-01	2.74e-01	9.48e-02						
Hydrocarbons-high molecular weight	1.75e+00	6.13e-01	9.48e-01	3.32e-01						
Water-based Ink #W2 – Site 1										
Amides or nitrogenous compounds	1.55e-01	5.42e-02	2.90e-01	1.01e-01	8.56e+00	2.99e+00			2.28e-01	7.97e-02
Hydrocarbons-high molecular weight	1.43e-01	4.97e-02	1.87e-01	6.47e-02	1.43e+00	4.95e-01			5.79e-02	2.01e-02
Hydrocarbons-low molecular weight	7.17e-02	2.49e-02	9.23e-02	3.20e-02					2.89e-02	1.00e-02
Hydrocarbons-high molecular weight	3.20e-02	1.12e-02								
Alcohols							1.30e-01	4.56e-02		
Ethylene glycol ethers					3.55e+00	1.24e+00				
Additive: <i>Isobutanol</i>	5.04e-02	1.76e-02					3.55e+00	1.24e+00	1.31e-01	4.59e-02
Additive: <i>Ethyl carbitol</i>	5.04e-02	1.76e-02					1.30e-01	4.56e-02	1.31e-01	4.59e-02
Additive: <i>Propanol</i>	3.98e+00	1.38e+00			8.84e-01	3.06e-01				
Additive: <i>Ammonia</i>							1.77e-01	6.20e-02		

Table 3-H.1 General Population Exposure Results, Fugitive and Stack Concentrations ^{a,b} (continued)

Chemical category <i>(additives in italics)</i>	Blue		Green		White		Cyan		Magenta	
	Concentration ($\mu\text{g}/\text{m}^3$)									
	fugitive	stack	fugitive	stack	fugitive	stack	fugitive	stack	fugitive	stack
Water-based Ink #W3 – Site 2										
Amides or nitrogenous compounds	1.96e+00	6.80e-01	2.62e+00	9.07e-01	4.31e+00	1.49e+00	1.51e+00	5.25e-01	1.62e+00	5.60e-01
Propylene glycol ethers							2.27e-01	7.95e-02	2.56e-01	8.95e-02
Alcohols	2.39e-02	8.27e-03	1.17e+00	4.05e-01						
Ethylene glycol ethers			5.79e-01	2.03e-01						
Alcohols					1.18e+00	4.12e-01				
Additive: Ammonia	1.44e-01	5.05e-02	7.74e-02	2.71e-02	1.57e-01	5.51e-02	1.84e-01	6.43e-02	1.84e-01	6.43e-02
Additive: Propanol	1.81e+00	6.26e-01	9.54e-01	3.31e-01	3.62e+00	1.25e+00			3.53e-02	1.22e-02
Additive: Isopropanol			4.24e-02	1.47e-02	4.90e-02	1.70e-02			2.12e-02	7.35e-03
Water-based Ink #W3 – Site 3										
Amides or nitrogenous compounds	1.38e+00	4.79e-01	2.59e+00	8.97e-01	6.10e+00	2.11e+00	7.27e-01	2.52e-01	4.66e-01	1.61e-01
Propylene glycol ethers							1.09e-01	3.82e-02	7.43e-02	2.60e-02
Alcohols			1.17e+00	4.05e-01						
Ethylene glycol ethers			5.79e-01	2.03e-01						
Alcohols					1.68e+00	5.87e-01				
Additive: Ammonia	1.15e+00	4.04e-01	2.35e-02	8.21e-03	1.87e+00	6.54e-01	1.99e-01	6.96e-02	1.99e-01	6.96e-02
Additive: Propanol	3.09e+00	1.07e+00			1.37e+01	4.75e+00				
Additive: 2-Butoxyethanol									8.31e-02	2.91e-02
Water-based Ink #W4 – Site 9A										
Alcohols	1.02e+00	3.52e-01	4.77e-01	1.65e-01	4.69e+00	1.63e+00	1.64e+00	5.67e-01	6.79e-01	2.35e-01
Amides or nitrogenous compounds	1.26e-01	4.43e-02	1.18e-01	4.16e-02	1.16e+00	4.09e-01	1.99e-01	7.00e-02	2.24e-01	7.89e-02
Hydrocarbons-high molecular weight	1.26e-01	4.43e-02	1.18e-01	4.16e-02	1.16e+00	4.09e-01	1.17e-01	4.12e-02	1.12e-01	3.95e-02
Amides or nitrogenous compounds	1.26e-01	4.40e-02	4.72e-01	1.65e-01			1.17e-01	4.10e-02	6.72e-01	2.35e-01
Alcohols			1.55e+00	5.39e-01	4.69e+00	1.63e+00			9.79e-01	3.39e-01
Propylene glycol ethers	1.01e+00	3.52e-01					0.00e+00	0.00e+00		
Propylene glycol ethers	1.01e+00	3.52e-01					1.53e+00	5.36e-01		
Amides or nitrogenous compounds			1.19e-01	4.13e-02	1.17e+00	4.06e-01				
Alcohols							4.73e-01	1.64e-01		
Additive: Ammonia	1.44e-01	5.05e-02	1.05e-01	3.67e-02			1.71e-01	5.97e-02	5.25e-02	1.84e-02
Additive: Propanol	8.26e-01	2.86e-01					9.76e-01	3.38e-01		

Table 3-H.1 General Population Exposure Results, Fugitive and Stack Concentrations ^{a,b} (continued)

Chemical category <i>(additives in italics)</i>	Blue		Green		White		Cyan		Magenta	
	Concentration ($\mu\text{g}/\text{m}^3$)									
	fugitive	stack	fugitive	stack	fugitive	stack	fugitive	stack	fugitive	stack
UV-cured Ink #U1 – Site 11										
Amides or nitrogenous compounds	3.12e-01	1.83e-01	1.97e+03	1.97e-01	1.11e+04	1.11e+00	6.78e+02	6.78e-02	6.57e+02	6.57e-02
Aromatic esters	1.46e+00	8.53e-01	9.20e+03	9.20e-01	5.19e+04	5.19e+00	3.16e+03	3.16e-01	3.07e+03	3.07e-01
Additive: <i>1,6-Hexanediol diacrylate</i>			5.40e+03	5.40e-01						
UV-cured Ink #U2 – Site 6										
Acrylated polyols	5.44e+00	3.18e+00	2.66e+04	2.66e+00	2.37e+05	2.37e+01	1.01e+04	1.01e+00	1.67e+04	1.67e+00
Acrylated polyols	3.90e+00	2.29e+00	7.49e+03	7.49e-01	9.64e+04	9.64e+00	1.15e+04	1.15e+00	1.32e+04	1.32e+00
Aromatic ketones	1.30e+00	7.61e-01	4.00e+03	4.00e-01	2.64e+04	2.64e+00	3.12e+03	3.12e-01	4.92e+03	4.92e-01
UV-cured Ink #U3 – Site 8										
Aromatic esters	6.06e-01	3.55e-01	3.36e+03	3.36e-01	3.09e+04	3.09e+00	2.59e+03	2.59e-01	2.11e+03	2.11e-01
Amides or nitrogenous compounds	1.30e-01	7.60e-02	7.19e+02	7.19e-02	6.62e+03	6.62e-01	5.55e+02	5.55e-02	4.52e+02	4.52e-02
Acrylated polyols	2.60e+00	1.53e+00	1.44e+04	1.44e+00			1.11e+04	1.11e+00	9.08e+03	9.08e-01

^aConcentrations estimated using average annual release estimates in the Industrial Source Complex Long Term (ISCLT) model.

^bShaded areas indicate where data are not applicable (i.e., the chemical category was not found in the particular color and formulation). If a chemical was found in a formulation, but resulted in no exposure to the general population, then the chemical category was not included in the table for that formulation.

Table 3-H.2 General Population Exposure Results, Average Daily Dose (ADD) and Average Daily Concentration (ADC)^a

Chemical category <i>(additives in italics)</i>	Blue		Green		White		Cyan		Magenta	
	ADD (mg/kg-d)	ADC (mg/m ³)								
Solvent-based Ink #S1 – Site 9B										
Alcohols	3.98e-04	2.11e-03	2.85e-04	1.51e-03	1.07e-03	5.66e-03	1.38e-04	7.30e-04	1.79e-04	9.47e-04
Alcohols	2.50e-03	1.32e-02	2.12e-03	1.12e-02	1.37e-02	7.29e-02			9.45e-04	5.01e-03
Alkyl acetates	1.33e-03	7.03e-03	1.52e-03	8.04e-03	1.07e-03	5.66e-03			8.10e-04	4.30e-03
Alcohols			4.27e-03	2.26e-02			4.99e-03	2.65e-02	4.58e-03	2.43e-02
Alkyl acetates			2.82e-04	1.50e-03			5.45e-04	2.89e-03	1.35e-04	7.16e-04
Propylene glycol ethers							3.41e-04	1.81e-03	2.70e-04	1.43e-03
Hydrocarbons - low molecular weight					1.22e-02	6.44e-02				
Alkyl acetates					2.81e-03	1.49e-02				
Additive: <i>Propanol</i>	1.38e-03	7.30e-03			6.88e-04	3.65e-03				
Additive: <i>Alkyl acetates</i>							3.16e-04	1.68e-03		
Additive: <i>Propylene glycol ether</i>									2.30e-04	1.22e-03
Solvent-based Ink #S2 – Site 5										
Alcohols	7.38e-03	3.92e-02	7.07e-03	3.75e-02	1.43e-02	7.59e-02	9.87e-03	5.23e-02	6.68e-03	3.54e-02
Alkyl acetates	1.69e-03	8.98e-03	1.50e-03	7.96e-03	6.78e-04	3.60e-03	2.78e-03	1.48e-02	1.72e-03	9.13e-03
Hydrocarbons - low molecular weight	1.54e-03	8.16e-03	2.29e-03	1.21e-02	7.58e-03	4.02e-02	1.98e-03	1.05e-02	3.45e-03	1.83e-02
Alcohols	9.27e-04	4.92e-03	1.05e-03	5.58e-03	1.56e-03	8.27e-03	1.38e-03	7.31e-03	1.90e-03	1.01e-02
Hydrocarbons - low molecular weight	7.80e-05	4.14e-04	5.91e-05	3.14e-04	3.20e-04	1.69e-03	1.24e-04	6.59e-04		
Alcohols	9.43e-04	5.00e-03	1.09e-03	5.80e-03			1.25e-03	6.65e-03	1.12e-03	5.96e-03
Solvent-based Ink #S2 – Site 7										
Alcohols	3.13e-03	1.66e-02	3.07e-03	1.63e-02	5.93e-03	3.15e-02	2.65e-03	1.41e-02	3.24e-03	1.72e-02
Alkyl acetates	2.80e-03	1.48e-02	2.61e-03	1.38e-02	3.38e-03	1.79e-02	2.46e-03	1.30e-02	2.87e-03	1.52e-02
Hydrocarbons - low molecular weight	1.19e-03	6.31e-03	1.29e-03	6.85e-03	4.91e-03	2.60e-02	8.10e-04	4.30e-03	2.15e-03	1.14e-02
Alcohols	7.16e-04	3.80e-03	5.96e-04	3.16e-03	1.01e-03	5.36e-03	5.64e-04	2.99e-03	1.18e-03	6.28e-03
Hydrocarbons - low molecular weight	6.01e-05	3.19e-04	3.34e-05	1.77e-04	2.07e-04	1.10e-03	5.08e-05	2.69e-04	7.56e-05	4.01e-04
Alcohols	7.90e-03	4.19e-02	8.14e-03	4.31e-02			6.46e-03	3.43e-02	8.37e-03	4.44e-02
Additive: <i>Propanol</i>					1.34e-02	7.09e-02				

Table 3-H.2 General Population Exposure Results, Average Daily Dose (ADD) and Average Daily Concentration (ADC)^a (continued)

Chemical category <i>(additives in italics)</i>	Blue		Green		White		Cyan		Magenta	
	ADD (mg/kg-d)	ADC (mg/m ³)								
Solvent-based Ink #S2 – Site 10										
Alcohols	2.53e-03	1.34e-02	3.14e-03	1.66e-02	5.24e-03	2.78e-02	2.56e-03	1.36e-02	2.68e-03	1.42e-02
Alkyl acetates	1.62e-03	8.58e-03	1.61e-03	8.55e-03	1.82e-03	9.68e-03	1.98e-03	1.05e-02	8.02e-04	4.25e-03
Hydrocarbons - low molecular weight	9.62e-04	5.10e-03	1.32e-03	7.00e-03	4.33e-03	2.30e-02	7.82e-04	4.14e-03	1.78e-03	9.42e-03
Alcohols	5.79e-04	3.07e-03	6.08e-04	3.22e-03	8.91e-04	4.73e-03	5.44e-04	2.89e-03	9.78e-04	5.19e-03
Hydrocarbons - low molecular weight	4.86e-05	2.58e-04	3.41e-05	1.81e-04	1.83e-04	9.68e-04	4.90e-05	2.60e-04	6.25e-05	3.31e-04
Alcohols	7.84e-03	4.16e-02	8.55e-03	4.54e-02			4.49e-03	2.38e-02	1.03e-02	5.45e-02
<i>Additive: Propanol</i>					1.58e-02	8.40e-02				
<i>Additive: Propylene glycol methyl ether</i>							4.05e-03	2.15e-02	8.94e-04	4.74e-03
<i>Additive: 2-Methoxy-1-propanol</i>							8.27e-05	4.39e-04	1.82e-05	9.68e-05
Water-based Ink #W1 – Site 4										
Amides or nitrogenous compounds	2.23e-04	1.18e-03	1.90e-04	1.01e-03	1.41e-03	7.49e-03	5.63e-05	2.99e-04	6.14e-05	3.26e-04
Alcohols	1.73e-03	9.18e-03	9.93e-04	5.26e-03	2.83e-03	1.50e-02	2.11e-04	1.12e-03		
Ethylene glycol ethers	5.46e-04	2.90e-03	3.27e-04	1.73e-03			3.84e-04	2.04e-03	3.96e-04	2.10e-03
Alcohols	8.92e-05	4.73e-04	5.06e-05	2.68e-04						
Hydrocarbons-high molecular weight	3.25e-04	1.72e-03	1.76e-04	9.33e-04						
Water-based Ink #W2 – Site 1										
Amides or nitrogenous compounds	2.87e-05	1.52e-04	5.37e-05	2.85e-04	1.59e-03	8.41e-03			4.22e-05	2.24e-04
Hydrocarbons-high molecular weight	2.65e-05	1.41e-04	3.45e-05	1.83e-04	2.64e-04	1.40e-03			1.07e-05	5.68e-05
Hydrocarbons-low molecular weight	1.33e-05	7.03e-05	1.71e-05	9.05e-05					5.34e-06	2.83e-05
Hydrocarbons-high molecular weight	5.93e-06	3.15e-05								
Alcohols							2.41e-05	1.28e-04		
Ethylene glycol ethers					6.58e-04	3.49e-03				
<i>Additive: Isobutanol</i>	9.34e-06	4.95e-05					6.58e-04	3.49e-03	2.43e-05	1.29e-04
<i>Additive: Ethyl carbitol</i>	9.34e-06	4.95e-05					2.41e-05	1.28e-04	2.43e-05	1.29e-04
<i>Additive: Propanol</i>	7.35e-04	3.90e-03			1.63e-04	8.67e-04				
<i>Additive: Ammonia</i>							3.28e-05	1.74e-04		

Table 3-H.2 General Population Exposure Results, Average Daily Dose (ADD) and Average Daily Concentration (ADC)^a (continued)

Chemical category <i>(additives in italics)</i>	Blue		Green		White		Cyan		Magenta		
	ADD (mg/kg-d)	ADC (mg/m ³)									
Water-based Ink #W3 – Site 2											
Amides or nitrogenous compounds	3.63e-04	1.92e-03	4.84e-04	2.57e-03	7.97e-04	4.23e-03	2.80e-04	1.48e-03	2.99e-04	1.59e-03	
Propylene glycol ethers								4.21e-05	2.23e-04	4.74e-05	2.52e-04
Alcohols	4.41e-06	2.34e-05	2.16e-04	1.15e-03							
Ethylene glycol ethers			1.07e-04	5.69e-04							
Alcohols					2.18e-04	1.16e-03					
Additive: Ammonia	2.68e-05	1.42e-04	1.44e-05	7.61e-05	2.92e-05	1.55e-04	3.41e-05	1.81e-04	3.41e-05	1.81e-04	
Additive: Propanol	3.34e-04	1.77e-03	1.76e-04	9.36e-04	6.69e-04	3.55e-03			6.54e-06	3.47e-05	
Additive: Isopropanol			7.84e-06	4.16e-05	9.07e-06	4.81e-05			3.92e-06	2.08e-05	
Water-based Ink #W3 – Site 3											
Amides or nitrogenous compounds	2.56e-04	1.36e-03	4.79e-04	2.54e-03	1.13e-03	5.98e-03	1.35e-04	7.13e-04	8.61e-05	4.57e-04	
Propylene glycol ethers								2.02e-05	1.07e-04	1.38e-05	7.31e-05
Alcohols			2.16e-04	1.15e-03							
Ethylene glycol ethers			1.07e-04	5.69e-04							
Alcohols					3.11e-04	1.65e-03					
Additive: Ammonia	2.14e-04	1.13e-03	4.35e-06	2.31e-05	3.46e-04	1.84e-03	3.69e-05	1.95e-04	3.69e-05	1.95e-04	
Additive: Propanol	5.72e-04	3.03e-03			2.53e-03	1.34e-02					
Additive: 2-Butoxyethanol									1.54e-05	8.17e-05	
Water-based Ink #W4 – Site 9A											
Alcohols	1.88e-04	9.97e-04	8.82e-05	4.68e-04	8.68e-04	4.60e-03	3.03e-04	1.60e-03	1.26e-04	6.66e-04	
Amides or nitrogenous compounds	2.34e-05	1.24e-04	2.19e-05	1.16e-04	2.16e-04	1.14e-03	3.69e-05	1.96e-04	4.16e-05	2.21e-04	
Hydrocarbons-high molecular weight	2.34e-05	1.24e-04	2.19e-05	1.16e-04	2.16e-04	1.14e-03	2.17e-05	1.15e-04	2.08e-05	1.10e-04	
Amides or nitrogenous compounds	2.33e-05	1.24e-04	8.75e-05	4.64e-04			2.17e-05	1.15e-04	1.25e-04	6.61e-04	
Alcohols			2.87e-04	1.52e-03	8.68e-04	4.60e-03			1.81e-04	9.60e-04	
Propylene glycol ethers	1.87e-04	9.90e-04					0.00e+00	0.00e+00			
Propylene glycol ethers	1.87e-04	9.90e-04					2.84e-04	1.51e-03			
Amides or nitrogenous compounds			2.20e-05	1.17e-04	2.17e-04	1.15e-03					
Alcohols							8.75e-05	4.64e-04			
Additive: Ammonia	2.68e-05	1.42e-04	1.95e-05	1.03e-04			3.16e-05	1.68e-04	9.73e-06	5.16e-05	
Additive: Propanol	1.53e-04	8.10e-04					1.81e-04	9.57e-04			

Table 3-H.2 General Population Exposure Results, Average Daily Dose (ADD) and Average Daily Concentration (ADC)^a (continued)

Chemical category <i>(additives in italics)</i>	Blue		Green		White		Cyan		Magenta	
	ADD (mg/kg-d)	ADC (mg/m ³)								
UV-cured Ink #U1 – Site 11										
Amides or nitrogenous compounds	6.80e-05	3.61e-04	7.33e-05	3.89e-04	4.14e-04	2.19e-03	2.52e-05	1.34e-04	2.44e-05	1.30e-04
Aromatic esters	3.17e-04	1.68e-03	3.42e-04	1.82e-03	1.93e-03	1.02e-02	1.18e-04	6.24e-04	1.14e-04	6.05e-04
Additive: <i>1,6-Hexanediol diacrylate</i>			2.00e-04	1.06e-03						
UV-cured Ink #U2 – Site 6										
Acrylated polyols	1.18e-03	6.28e-03	9.89e-04	5.24e-03	8.80e-03	4.67e-02	3.75e-04	1.99e-03	6.19e-04	3.28e-03
Acrylated polyols	8.50e-04	4.51e-03	2.78e-04	1.47e-03	3.58e-03	1.90e-02	4.26e-04	2.26e-03	4.88e-04	2.59e-03
Aromatic ketones	2.83e-04	1.50e-03	1.49e-04	7.88e-04	9.82e-04	5.21e-03	1.16e-04	6.15e-04	1.83e-04	9.70e-04
UV-cured Ink #U3 – Site 8										
Aromatic esters	1.32e-04	7.00e-04	1.25e-04	6.62e-04	1.15e-03	6.09e-03	9.63e-05	5.10e-04	7.84e-05	4.16e-04
Amides or nitrogenous compounds	2.83e-05	1.50e-04	2.67e-05	1.42e-04	2.46e-04	1.31e-03	2.06e-05	1.09e-04	1.68e-05	8.91e-05
Acrylated polyols	5.66e-04	3.00e-03	5.36e-04	2.84e-03			4.13e-04	2.19e-03	3.37e-04	1.79e-03

^a Shaded areas indicate where data are not applicable (i.e., the chemical category was not found in the particular color and formulation). If a chemical was found in a formulation, but resulted in no exposure to the general population, the chemical category was not included in the table for that formulation.